

June 1996



Mathematics 30

Grade 12 Diploma Examination

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June 1996

Mathematics 30

Grade 12 Diploma Examination

Description

Time: 2.5 h. You may take an additional 0.5 h to complete the examination.

This is a **closed-book** examination consisting of **three** parts:

Part A

has 40 multiple-choice questions

Part B

has 9 numerical-response questions

Parts **A** and **B** are worth 70% of the examination.

Part C

has 3 written-response questions, each worth 10% of the examination

A tear-out formula sheet and a z-score page are included in this booklet.

All graphs on this examination are computer-generated.

Instructions

- Fill in the information required on the answer sheet and the examination booklet as directed by the presiding examiner.
- You are expected to provide your own scientific calculator.
- Carefully read the instructions for each part before proceeding.
- The presiding examiner will collect your answer sheet and examination booklet and send them to Alberta Education.
- Do not fold the answer sheet.

Note: *The perforated pages at the back of this booklet may be torn out and used for your rough work. No marks will be given for work done on the tear-out pages.*

Part A: Multiple Choice

40 Questions

Instructions

- Consider all numbers used in the questions to be **exact real** numbers and not the result of a measurement.
- Read each question carefully and decide which of the choices completes the statement or answers the question.
- Locate that question number on the separate answer sheet provided and fill in the circle that corresponds to your choice.

Example

This diploma examination is for the subject of

- A. biology
- B. physics
- C. chemistry
- D. mathematics

Answer Sheet

(A) (B) (C) ●

- Use an **HB pencil only**.
- If you wish to change an answer, erase **all** traces of your first answer.

Note: The perforated pages at the back of this booklet may be torn out and used for your rough work. **No marks** will be given for work done on the tear-out pages.

Do not turn the page to start the examination until told to do so by the presiding examiner.



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1. When $P(x) = -3x^3 + 4x^2 - 7x + 2$ is divided by $D(x) = x - 2$, then
- A. the remainder is -20
 - B. $P(x)$ is divisible by $D(x)$
 - C. the quotient is $-3x^3 - 2x + 3$
 - D. $P(x) = Q(x) \cdot D(x) + 8$, where $Q(x)$ is a polynomial of degree 2
2. The polynomial $4x^3 - 3hx^2 + 2kx - 15$ is divisible by $x - 1$, but when it is divided by $x + 1$, the remainder is -6 . The values of h and k respectively are
- A. -4 and $-\frac{1}{2}$
 - B. -4 and $-\frac{7}{2}$
 - C. 4 and $\frac{1}{2}$
 - D. 4 and $\frac{23}{2}$
3. A family of third-degree polynomial functions is defined by

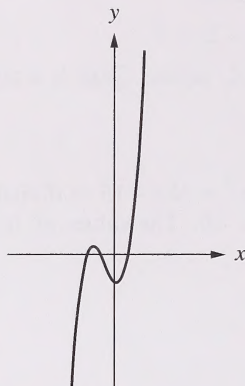
$$P(x) = a(x - b)(x - c)(x - d), \quad a \neq 0,$$

where b , c , and d are distinct non-zero real numbers. The **minimum** amount of information that is sufficient to determine the exact values of a , b , c , and d for a specific function in this family is

- A. the coordinates of three points that lie on the graph of $y = P(x)$
- B. the y -intercept of the graph of $y = P(x)$
- C. the x -intercepts of the graph of $y = P(x)$
- D. both the x -intercepts and y -intercept of the graph of $y = P(x)$

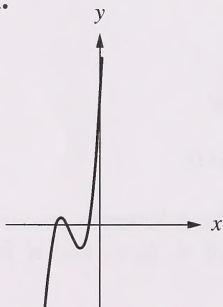
Use the following information to answer the next question.

The graph of $y = P(x)$ is shown below.

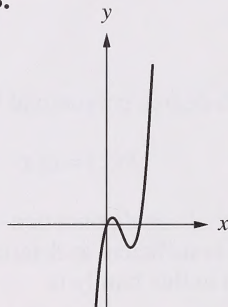


4. The graph of $y = 2P(x)$ could look like

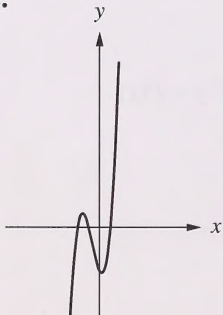
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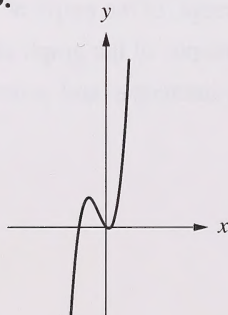
B.



C.

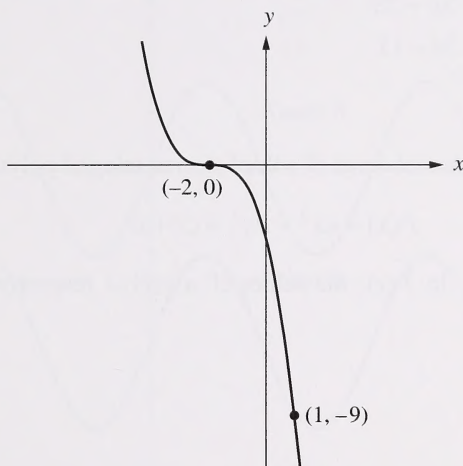


D.



Use the following information to answer the next question.

$P(x)$ is a third-degree polynomial function with one root of multiplicity 3. The graph of $y = P(x)$ passes through the points $(-2, 0)$ and $(1, -9)$, as shown below.



5. The coefficient of the third-degree term of $P(x)$ is

A. -1

B. $-\frac{1}{3}$

C. $\frac{1}{3}$

D. 1

6. When a polynomial $P(x)$ is divided by $2x + 3$, the quotient is $x^2 - 3x + 2$ and the remainder is -17 . The polynomial $P(x)$ is

- A. $x^2 - x + 22$
- B. $x^2 - x - 12$
- C. $2x^3 - 3x^2 - 5x + 23$
- D. $2x^3 - 3x^2 - 5x - 11$

7. All the potential rational zeros of a third-degree integral polynomial function

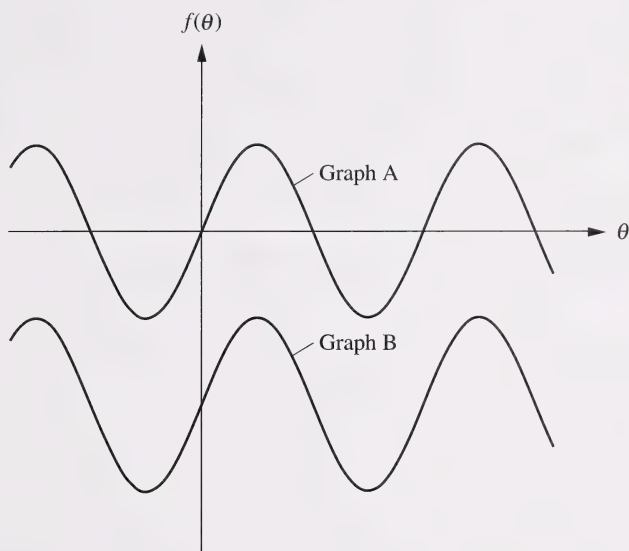
$$P(x) = ax^3 + bx^2 + cx + d$$

are ± 1 and $\pm \frac{1}{2}$. In $P(x)$, the values of a and d respectively could be

- A. 2 and 1
- B. 1 and 2
- C. $\frac{1}{4}$ and 1
- D. $\frac{1}{2}$ and 1

Use the following information to answer the next question.

The graphs of two sinusoidal functions are shown below.



8. The function whose graph is B was obtained from the function whose graph is A by **one** of the following changes. That change was
- A. a phase shift
 - B. a period change
 - C. a change of amplitude
 - D. the addition of a negative constant
-
9. If θ is an acute angle, then the expression $\sqrt{\frac{1 - \sin^2 \theta}{1 + \tan^2 \theta}}$ is equal to
- A. $\cos \theta \sin \theta$
 - B. $\cos^2 \theta$
 - C. $\cos \theta$
 - D. 1

Use the following information to answer the next question.

$$f(\theta) = 3 \sin \left(2\theta - \frac{\pi}{6} \right)$$

$$g(\theta) = -4 \cos \left(2\theta + \frac{\pi}{2} \right)$$

$$h(\theta) = 4 \cos \left(\frac{\theta}{6} \right)$$

$$s(\theta) = 3 \sin \left(\theta + \frac{\pi}{2} \right)$$

10. Which of the functions have the same period?

- A. $f(\theta)$ and $g(\theta)$
 - B. $g(\theta)$ and $h(\theta)$
 - C. $g(\theta)$ and $s(\theta)$
 - D. $f(\theta)$ and $s(\theta)$
-

11. The expression $\frac{1}{1 - 2 \cos \theta}$ is undefined when the values of θ are

- A. $\pm \frac{\sqrt{3}}{2}$
- B. $\pm \frac{1}{2}$
- C. $\pm \frac{\pi}{3} + 2n\pi, n \in I$
- D. $\pm \frac{\pi}{6} + 2n\pi, n \in I$

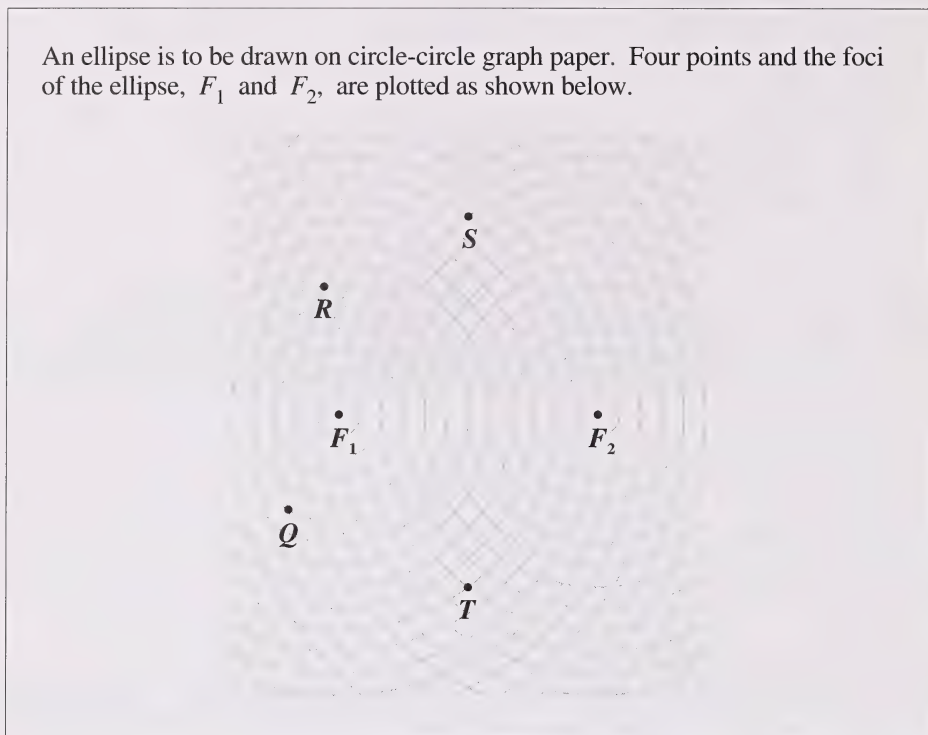
12. A student graphed the two trigonometric functions $f(x)$ and $g(x)$ using a graphing calculator. The student set the domain as 0° to 360° and the range as -10 to 10 . If the graphs intersect at one point $P(a, b)$, then a statement that must be **true** is
- A. $f(a) = g(a) = b$
 - B. $f(a) = g(a) = 0$
 - C. $f(x) \geq g(x)$
 - D. $f(x) \leq g(x)$
13. The expression $\csc\left(\frac{\pi}{2} - \theta\right)$ is equivalent to
- A. $-\cos \theta$
 - B. $\csc \theta$
 - C. $\sec \theta$
 - D. $1 - \csc \theta$
14. The y -intercept of the graph of $y = a^x$, $a > 0$, is
- A. 0
 - B. 1
 - C. undefined
 - D. dependent on the value of a
15. If $\frac{1}{3}(27)^{x-1} = \sqrt[4]{9^x}$, then the value of x is
- A. -0.80
 - B. 0.86
 - C. 1.33
 - D. 1.60

16. The expression $3^{\log_2(8)}$ is equal to
- A. 3
 - B. 12
 - C. 27
 - D. 81
17. If $2 \log_2 x + \log_2 16 = \log_2 9$, then the value of x is
- A. $\frac{7}{2}$
 - B. $\frac{9}{8}$
 - C. $\frac{3}{4}$
 - D. $\frac{9}{32}$
18. If $5 \log_7 y = 2 \log_7 m$, then m is equal to
- A. $y^{\frac{5}{2}}$
 - B. $y^{\frac{2}{5}}$
 - C. y^5
 - D. y^{10}

19. The value of $\sum_{n=1}^5 \log_{10} n$ is
- A. $\log_{10} 5$
 - B. $\log_{10} 6$
 - C. $\log_{10} 15$
 - D. $\log_{10} 120$
20. A strain of bacteria grows exponentially. Immediately after 2 h there were 1 000 bacteria, and immediately after 3 h there were 5 000 bacteria. If no bacteria die, then the time to the nearest hundredth of an hour for the population to double is
- A. 0.20 h
 - B. 0.43 h
 - C. 1.29 h
 - D. 2.32 h
21. A plane intersects a double-napped circular cone in **both** nappes. The plane does **not** pass through the vertex of the cone. The locus produced by such an intersection of the cone and the plane is
- A. a parabola
 - B. a hyperbola
 - C. two parallel lines
 - D. a pair of intersecting lines
22. For given values of D , E , and F , the graph of $x^2 + y^2 + Dx + Ey + F = 0$ is a non-degenerate circle. If F is decreased, then the
- A. centre is not moved and the radius is decreased
 - B. centre is moved and the radius is decreased
 - C. centre is not moved and the radius is increased
 - D. centre is moved and the radius is increased

Use the following information to answer the next question.

An ellipse is to be drawn on circle-circle graph paper. Four points and the foci of the ellipse, F_1 and F_2 , are plotted as shown below.

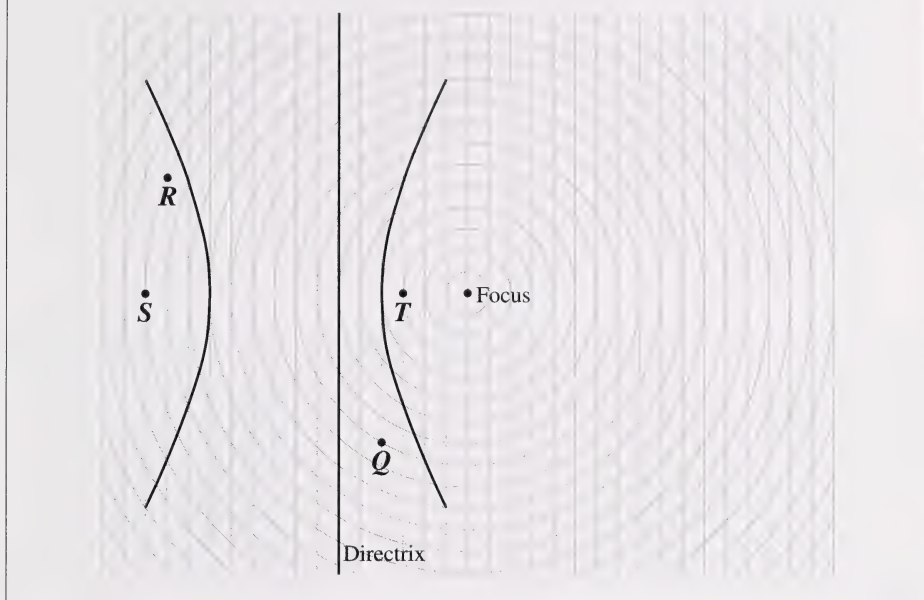


23. One of the 4 points, Q , R , S , or T , does **not** lie on the ellipse, while the other 3 points do. The point that could not lie on this ellipse is the point labelled

- A. Q
- B. R
- C. S
- D. T

Use the following information to answer the next question.

A hyperbola and the points Q , R , S , and T are shown on the circle-line graph paper below.



24. One of the points, Q , R , S , or T , lies on a hyperbola that has an eccentricity greater than the eccentricity of the hyperbola shown. If the focus and directrix are the same for both hyperbolas, then the point that satisfies this condition is point

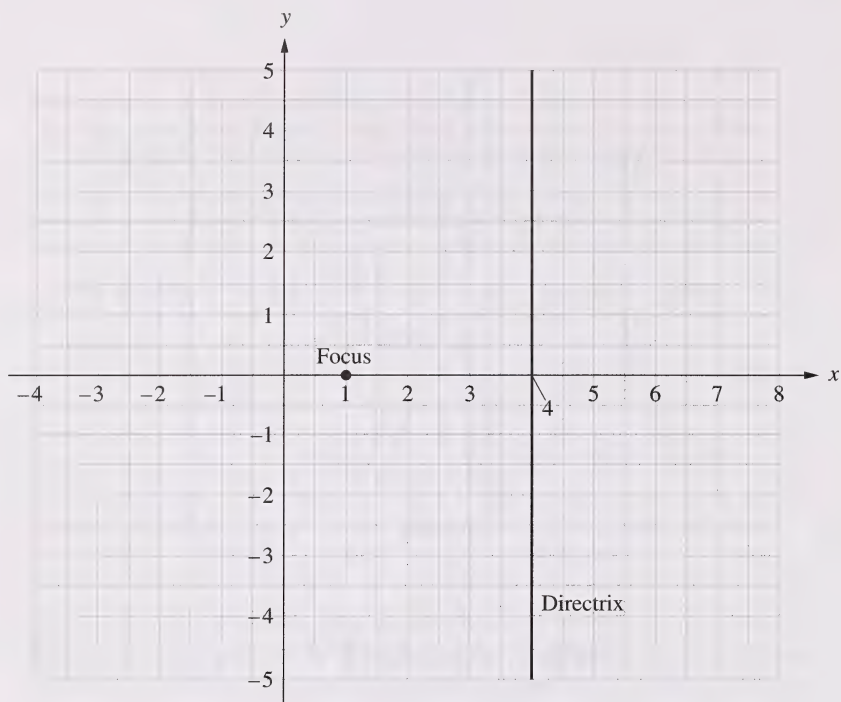
- A. Q
- B. R
- C. S
- D. T

25. Given a fixed line and a fixed point not on the line, a point P moves so that its distance from the line is always three times its distance from the point. The locus of P is

- A. a circle
- B. an ellipse
- C. a parabola
- D. a hyperbola

Use the following information to answer the next question.

The focus and the directrix of a quadratic relation are $(1, 0)$ and $x = 4$, as shown below.



26. If a point $(b, 0)$ lies on this quadratic relation, then a parabola is formed when
- A. $b = 1$
 - B. $b = 2.5$
 - C. $1 < b < 2.5$
 - D. $2.5 < b < 4$

27. In an arithmetic sequence, the third term is 1 and the sixth term is 5. The first term of this sequence is

- A. $\frac{11}{3}$
- B. $\frac{5}{3}$
- C. $-\frac{5}{3}$
- D. $-\frac{11}{3}$

28. A sequence is defined by $t_n = 2n + 1, n \in N$. This sequence is

- A. infinite and geometric
- B. finite and geometric
- C. finite and arithmetic
- D. infinite and arithmetic

29. A sequence is defined recursively by

$$t_1 = 1$$

$$t_n = 2t_{n-1} + 1, n \geq 2$$

The first four terms in this sequence are

- A. 1, 3, 5, 7
- B. 1, 3, 7, 15
- C. 1, 3, 9, 27
- D. 1, 5, 7, 9

30. The value of $\sum_{n=2}^5 \log_n n^2$ is

- A. 8
- B. 14
- C. 28
- D. 54

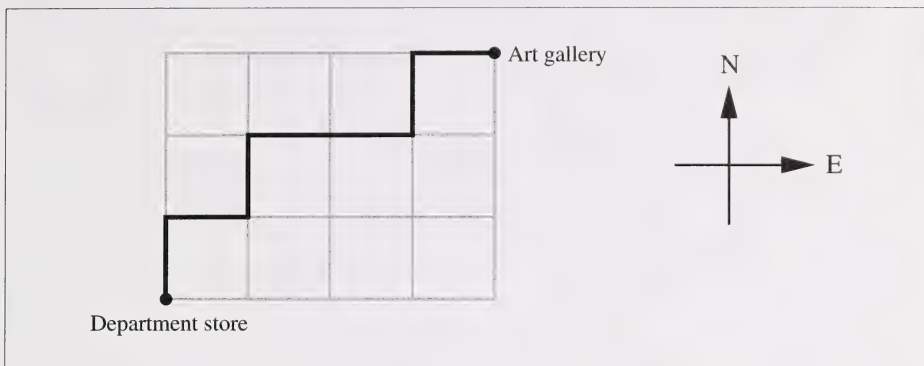
31. In a geometric sequence, the fourth term, t_4 , is 108 and $t_6 = 972$. If the common ratio is positive, then the sum of the first ten terms of the sequence is

- A. 1 080
- B. 39 364
- C. 78 732
- D. 118 096

32. An example of a geometric sequence is

- A. $\sqrt{2}, -2, -2\sqrt{2}, 4$
- B. $0, -\sqrt{2}, -2, -2\sqrt{2}$
- C. $\sqrt{2}, 2, 2\sqrt{2}, 4$
- D. $0, \sqrt{2}, 2, 2\sqrt{2}$

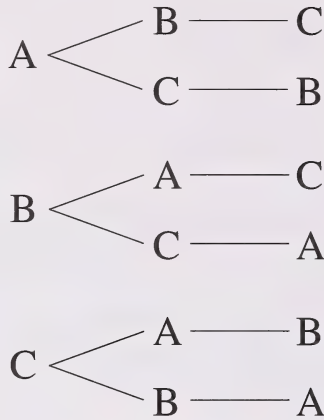
Use the following information to answer the next question.



33. Tommy is walking from the department store to the art gallery. If Tommy walks only north or east, then there are 35 different possible routes. The probability, correct to the nearest thousandth, that he will select the route indicated in the diagram is
- A. 0.029
- B. 0.065
- C. 0.083
- D. 0.143
-
34. The number of different groups of two or more people that can be chosen from a group of five people is
- A. 25
- B. 26
- C. 31
- D. 32

Use the following information to answer the next question.

A student models a problem with the following diagram.



35. The model allows the student to list all of the

- A. permutations of 3 items
 - B. combinations of 3 items
 - C. permutations of 6 items
 - D. combinations of 6 items
-

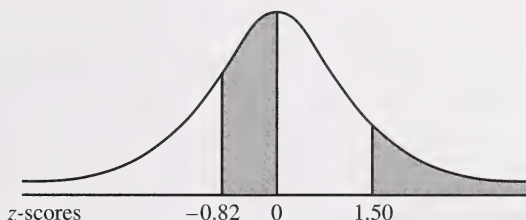
36. The expression ${}_6C_6 + {}_6C_5 + {}_6C_4 + {}_6C_3 + {}_6C_2 + {}_6C_1 + {}_6C_0$ is equal to

- A. 2^6
- B. $2^6 - 1$
- C. 6^2
- D. $6^2 - 1$

37. All phone numbers from the Lac La Biche telephone exchange begin with the digits 623. The maximum number of seven-digit telephone numbers available for Lac La Biche is
- A. ${}_9P_4$
- B. ${}_{10}P_4$
- C. 9^4
- D. 10^4

Use the following information to answer the next question.

The probability of some given event can be determined from the shaded region in this sketch of a standard normal distribution.



38. Correct to the nearest hundredth, the probability of the event is
- A. 0.73
- B. 0.36
- C. 0.23
- D. 0.14

39. The results of a provincial mathematics exam are normally distributed. A news release indicated that 4 000 students scored between 57.0% and 73.1% on the exam. If these percentages translate to z -scores of -0.20 and 1.41 respectively, then the approximate number of students who wrote the exam is
- A. 11 700
 - B. 8 000
 - C. 6 400
 - D. 4 800
40. In a standard normal distribution, 70.5% of the data lies between z -scores of -1.87 and
- A. 0.24
 - B. 0.47
 - C. 0.63
 - D. 0.82

You have now completed Part A. Proceed directly to Part B.

Part B: Numerical Response
9 Questions

Instructions

- Consider all numbers used in the questions to be **exact positive real** numbers and not the result of a measurement.
- Read each question carefully.
- Record your answer on the answer sheet provided by writing it in the boxes and then filling in the corresponding circles.
- **Enter the first digit of your answer in the left-hand box and leave any unused boxes blank.**
- Use an HB pencil only.
- If you wish to change an answer, erase **all** traces of your first answer.

Sample Questions and Solutions

Correct to the nearest tenth of a radian, 40° is equal to _____ rad.

$$40^\circ = 0.6981317008 \dots \text{ rad}$$

Record 0.7 on the answer sheet

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For the arithmetic series $-8 + (-5) + (-2) + \dots + (85)$, the number of terms is _____.

$$85 = -8 + (n - 1)(3)$$

$$93 = 3n - 3$$

$$n = 32$$

Record 32 on the answer sheet

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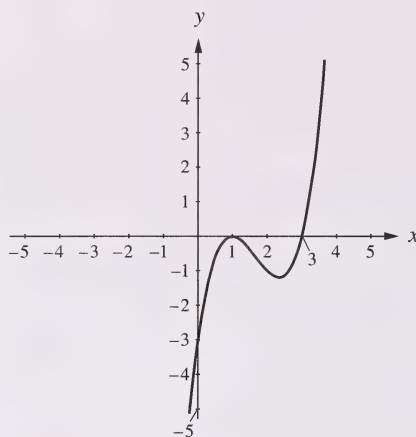
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9

Start Part B immediately.

Use the following information to answer the next question.

The graph of $y = (x - 1)^2(x - 3)$ is shown below.



1. If $A(4.7, m)$ is a point on the graph, then the value of m , correct to the nearest tenth, is _____.

(Record your answer on the answer sheet.)

2. The range of a trigonometric function $f(\theta) = a \sin \theta + d$ is $6.0 \leq f(\theta) \leq 15.0$. Correct to the nearest tenth, the value of d is _____.

(Record your answer on the answer sheet.)

- 3.** If $(5 \sin \theta + 4)(\sin \theta - 2) = 0$, $180^\circ < \theta < 270^\circ$, then the value of θ , correct to the nearest degree, is _____.

(Record your answer on the answer sheet.)

- 4.** If $10^a = 4$, then 10^{1+2a} , correct to the nearest whole number, is equal to _____.

(Record your answer on the answer sheet.)

- 5.** A quantity of water contains 200 g of pollutants. Each time this quantity of water passes through a filter, 15% of its pollutants are removed. Correct to the nearest tenth of a gram, the number of grams of pollutants still in the water after it passes through 6 filters is _____.

(Record your answer on the answer sheet.)

6. The point $Q(5, 7)$ lies on a parabola that has its focus at $F(7, 10)$. Correct to the nearest tenth, the distance from point Q to the directrix of the parabola is _____.

(Record your answer on the answer sheet.)

7. A random number generator prints 2-digit numbers greater than or equal to 10. Correct to the nearest hundredth, the probability that the first 2-digit number printed is divisible by 5 is _____.

(Record your answer on the answer sheet.)

- 8.** The number of ways that 4 marbles can be chosen from a group of 20 different marbles is equal to the number of ways m marbles can be chosen from the same 20 marbles. If $m \neq 4$, then the value of m is _____.

(Record your answer on the answer sheet.)

- 9.** On a test where the scores are normally distributed, the mean is 65. A student scores 77, which is 1.6 standard deviations above the mean. Correct to the nearest tenth, the standard deviation of the test scores is _____.

(Record your answer on the answer sheet.)

You have now completed Part B. Proceed directly to Part C.

Part C: Written Response

3 Questions

Instructions

- Consider all numbers used in the question to be **exact real** numbers and not the result of a measurement.
- Read each question carefully.
- Write your answers in the examination booklet as neatly as possible.
- For full marks, your answers **must show all** pertinent explanations, calculations, and formulas.
- Your answers **should be** presented in a well-organized manner using complete sentences for a written response, and correct units for a numerical response.

Note: The perforated pages at the back of this booklet may be torn out and used for your rough work. **No marks** will be given for work done on the tear-out pages.

Start Part C immediately.



Written Response – 10%

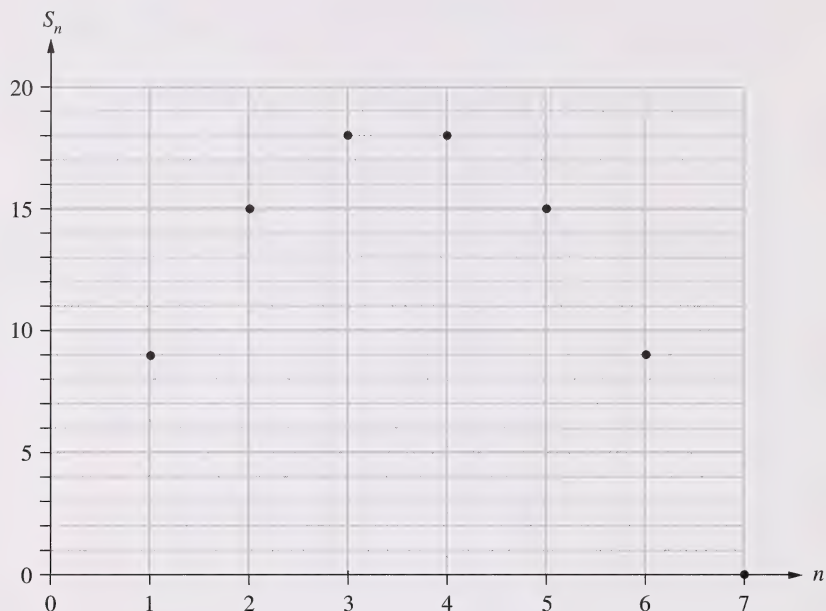
1. The owner of a small motel has 6 motel rooms to rent. If 6 people each book one motel room for a certain night, then the owner has 720 ways to assign the 6 rooms. If 5 people book one motel room each for another night, then the owner still has the same number of ways to assign the rooms.
- Clearly explain why there is no difference in the number of ways of assigning rooms to 5 people or assigning rooms to 6 people.
 - If t_1 is the number of ways of assigning one person to one of six rooms, and t_k is the number of ways of assigning k people to k of the 6 rooms, find the **value** of t_k for $1 \leq k \leq 6$.
 - If the motel has m rooms, determine the number of ways the owner can assign k people to the m rooms.

Written-response question 2 begins on the next page.



Written Response – 10%

2. The first term of an arithmetic sequence is 9, and the common difference is -3 . The graphical representation of the sum of the terms of this arithmetic sequence is shown below. Each point on the graph is in the form (n, S_n) where $n \in \mathbb{N}$ and S_n is the sum of the first n terms.



- The graph of S_n shows that $S_2 = S_5$. Show algebraically or arithmetically $S_2 = S_5$.

- Provide an example of an arithmetic sequence for which the sum of the first k terms, S_k is **never** equal to the sum of the first j terms, S_j for any $k \neq j$, $j, k \in N$.
- Identify and explain conditions for an arithmetic sequence to have $S_j = S_k$ for some $j \neq k$, $j, k \in N$. Examples or use of a diagram similar to the one given may aid in your explanation.

Written-response question 3 begins on the next page.

Written Response – 10%

- 3.** A group of students is asked to solve the equation

$$\cos \theta - 2\sin^2 \theta + 1 = 0, \quad 0 < \theta < 2\pi.$$

The students discussed three different methods of solving the equation.

Method 1

Determine the solution to the equation algebraically by substituting $1 - \cos^2 \theta$ for $\sin^2 \theta$ and solving for θ in the stated domain.

Method 2

Estimate the solution to the equation by graphing $y = \cos \theta - 2 \sin^2 \theta + 1$ and finding the θ -intercepts in the stated domain.

Method 3

Estimate the solution to the equation by graphing $y = 2 \sin^2 \theta$ and $y = \cos \theta + 1$ and finding where they intersect in the stated domain.

- Use **Method 1** to solve the equation for exact values of θ .

Mathematics 30 Formula Sheet

The following information may be useful in writing this examination.

- The roots of the quadratic equation $ax^2 + bx + c = 0$ are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- The distance between two points (x_1, y_1) and (x_2, y_2) is

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Quadratic Relations

- $$e = \frac{|\overline{PF}|}{|\overline{PD}|}$$

Trigonometry

- $$\text{arc length } a = r\theta$$

- $$\sin^2 A + \cos^2 A = 1$$

- $$1 + \tan^2 A = \sec^2 A$$

- $$1 + \cot^2 A = \csc^2 A$$

- $$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

- $$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

- $$\csc A = \frac{1}{\sin A}$$

- $$\sec A = \frac{1}{\cos A}$$

- $$\cot A = \frac{\cos A}{\sin A}$$

- $$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

- $$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

Permutations and Combinations

- $${}_nP_r = \frac{n!}{(n-r)!}$$

- $${}_nC_r = \frac{n!}{r!(n-r)!}$$

- In the expansion of $(x + y)^n$, the general term is $t_{k+1} = {}_nC_k x^{n-k} y^k$

Sequences and Series

- $$t_n = a + (n-1)d$$

- $$S_n = \frac{n[2a + (n-1)d]}{2}$$

- $$S_n = n \left(\frac{a + t_n}{2} \right)$$

- $$t_n = ar^{n-1}$$

- $$S_n = \frac{a(r^n - 1)}{r - 1}, r \neq 1$$

- $$S_n = \frac{rt_n - a}{r - 1}, r \neq 1$$

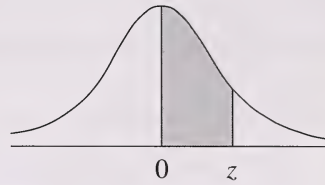
Exponential and Logarithmic Functions

- $$\log_a mn = \log_a m + \log_a n$$

- $$\log_a \frac{m}{n} = \log_a m - \log_a n$$

- $$\log_a m^n = n \log_a m$$

$$z = \frac{x - \mu}{\sigma}$$



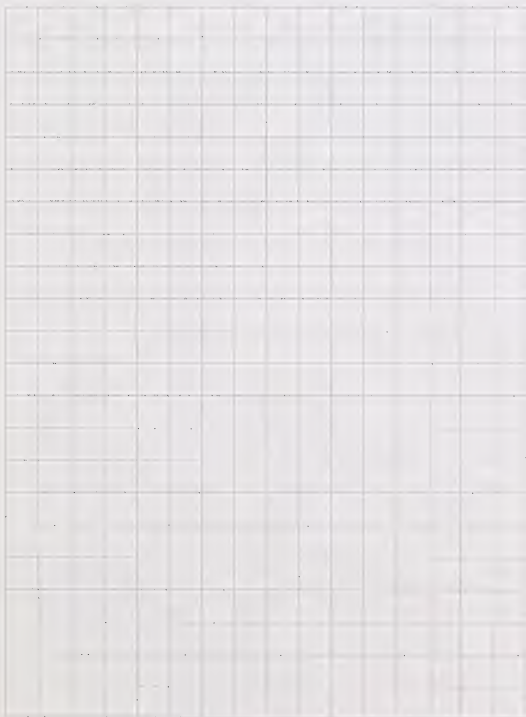
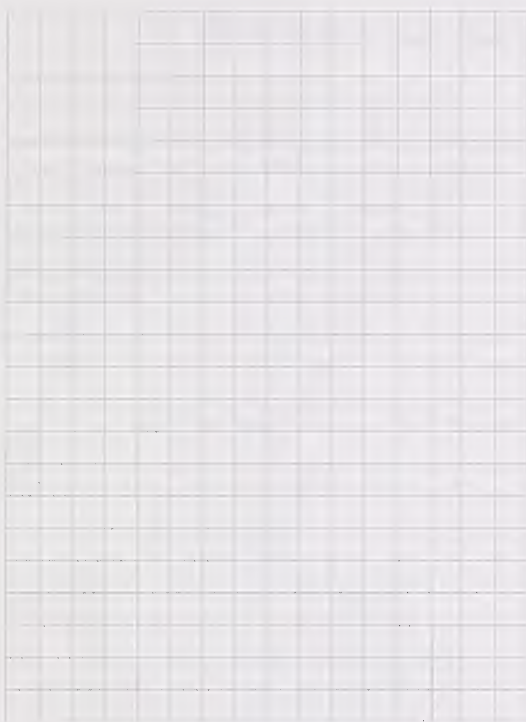
Areas under the Standard Normal Curve

<i>z</i>	0	1	2	3	4	5	6	7	8	9
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0754
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2258	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2518	0.2549
0.7	0.2580	0.2612	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2996	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.7	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.8	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.9	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000

Fold and tear along perforation.

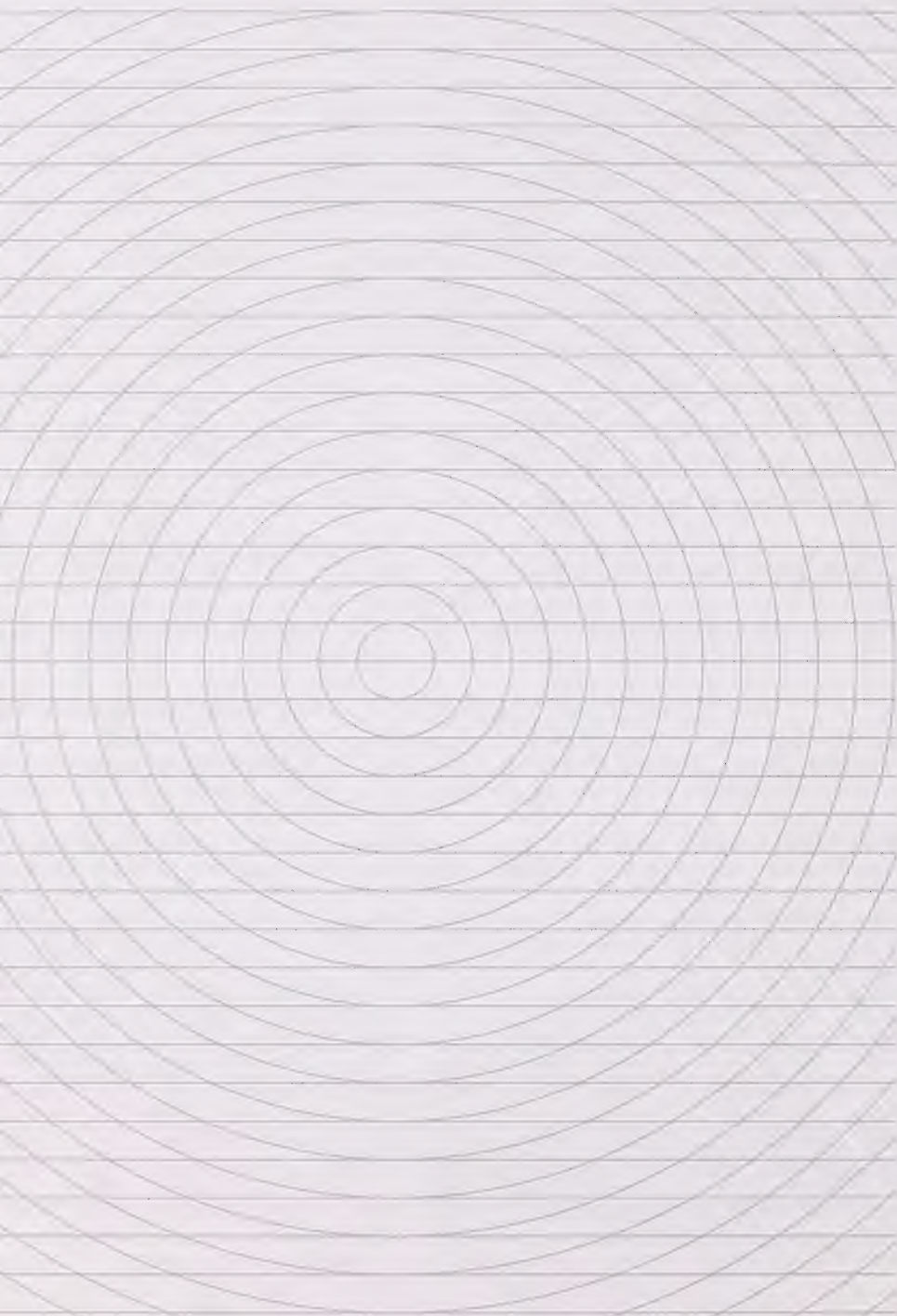
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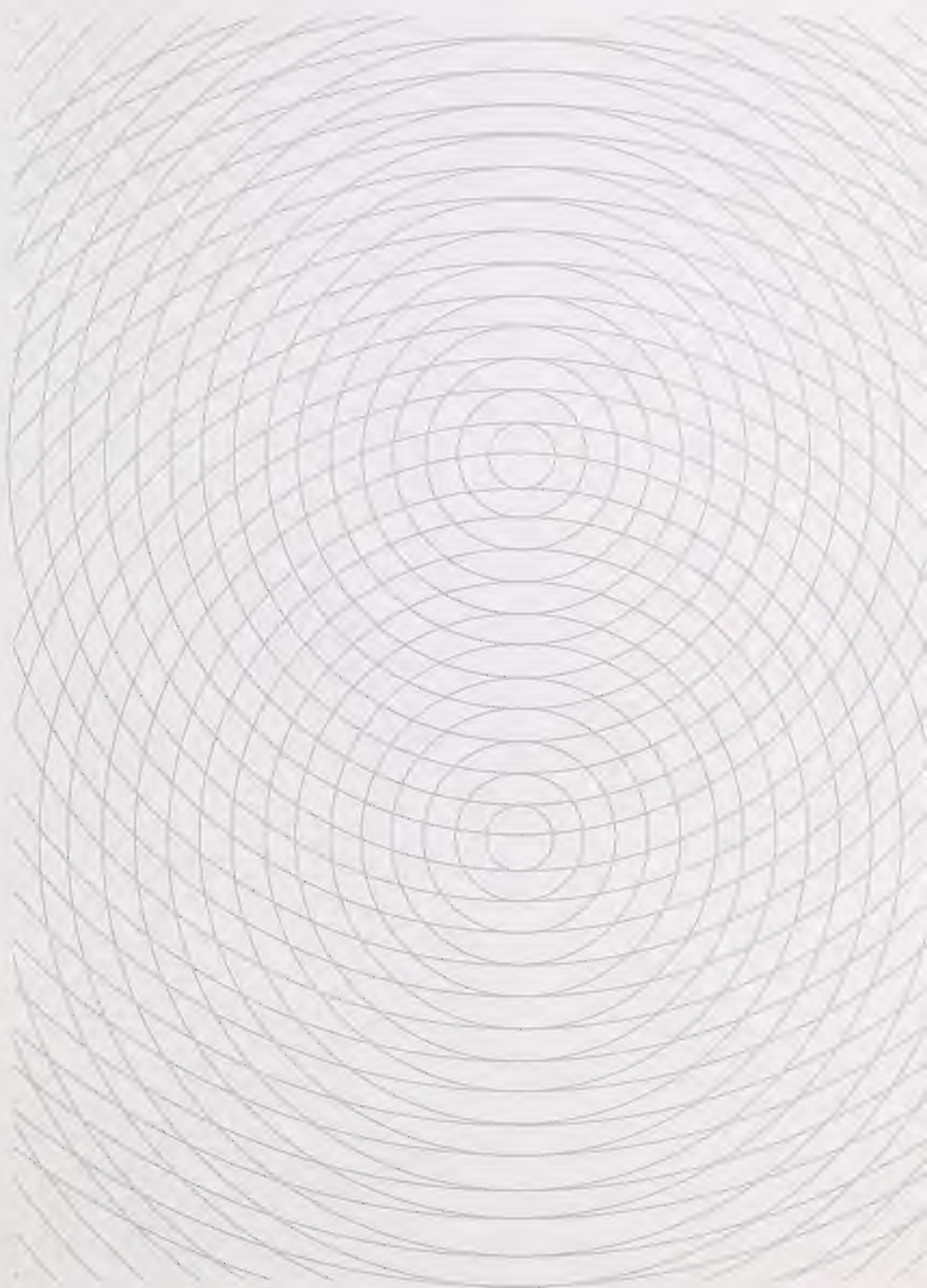
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